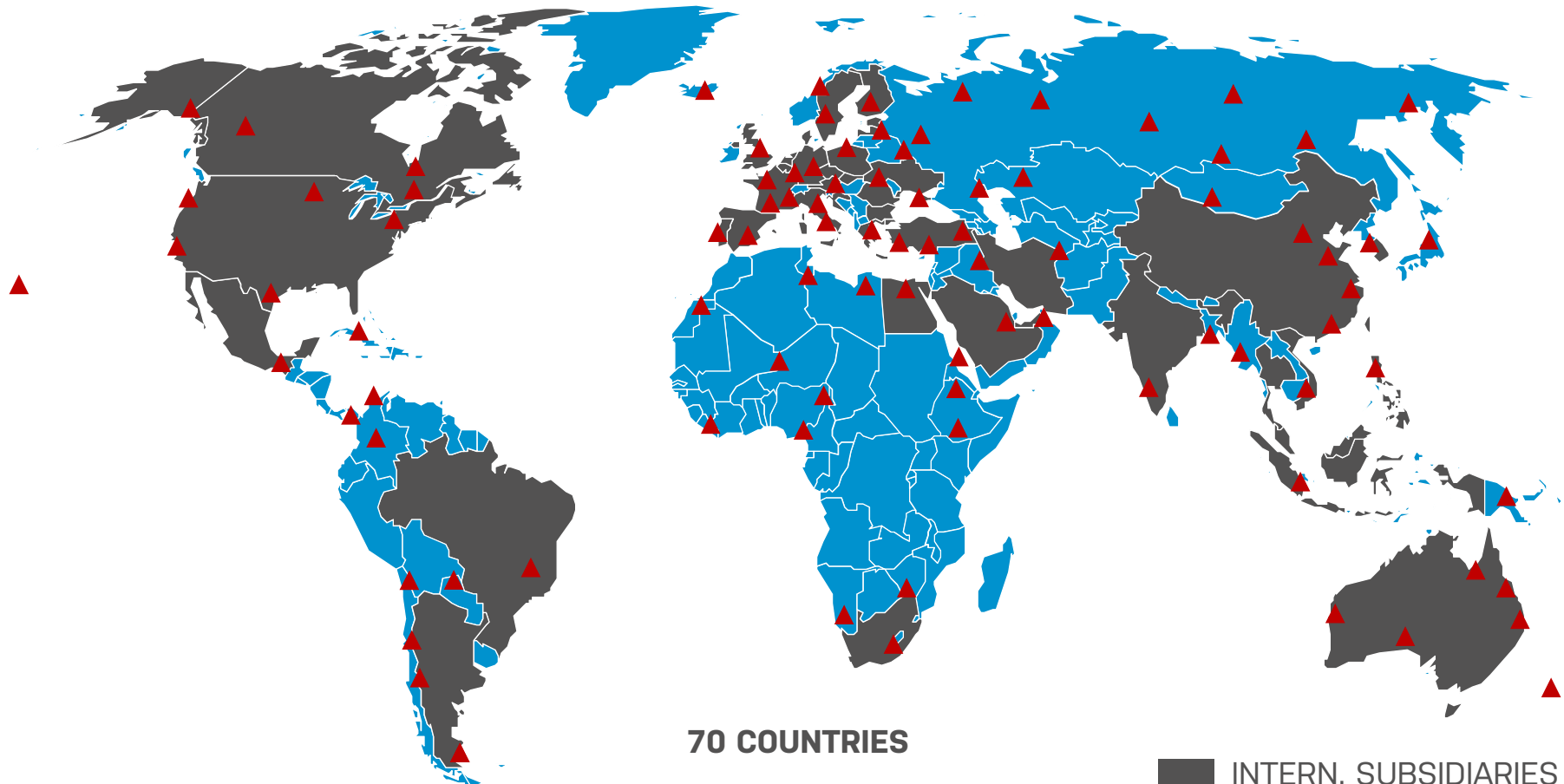


THE ENERGY EFFICIENCY REVOLUTION – STILL AN ISSUE?

ANDREAS ZIOLEK

T

TÜV NORD GROUP WORLDWIDE



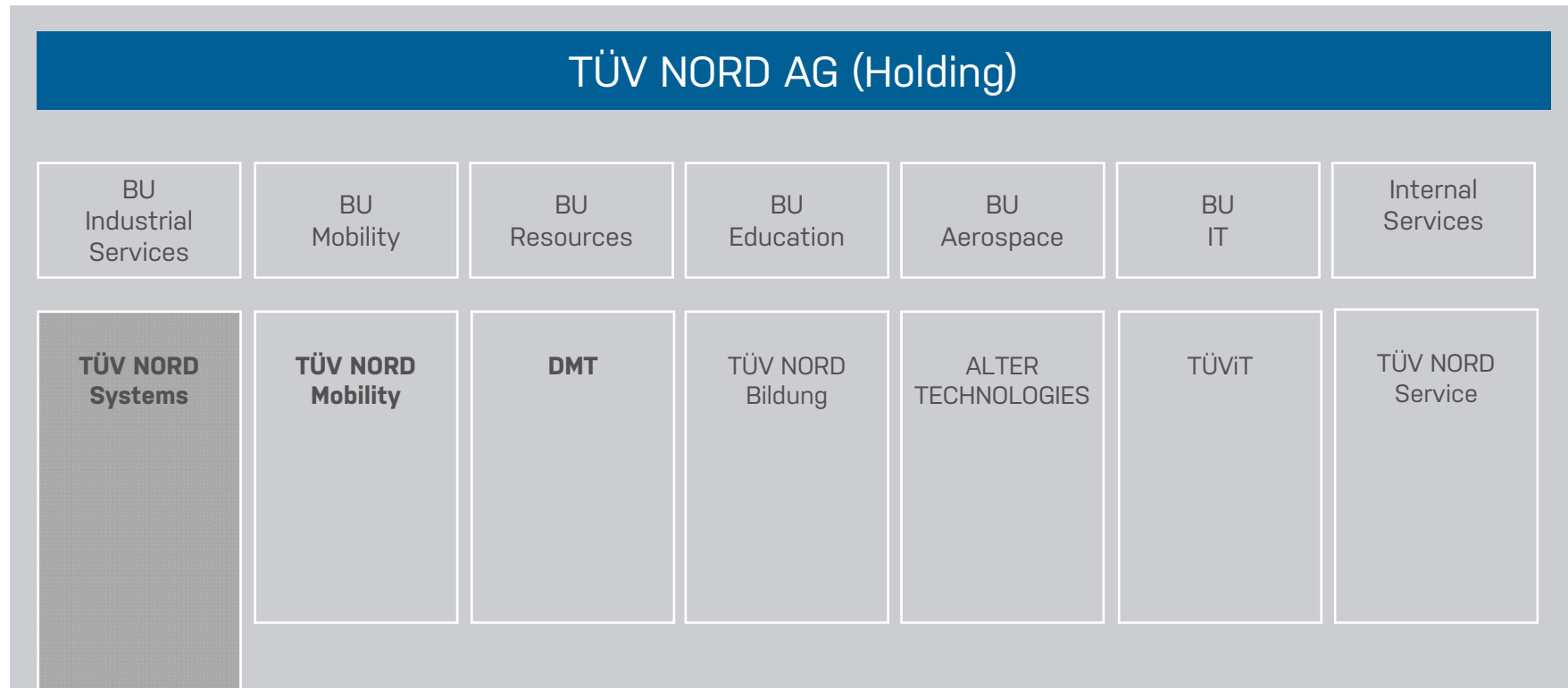
70 COUNTRIES

85 SUBSIDIARIES

more than 1 billion turnover

■ INTERN. SUBSIDIARIES
▲ PROJECTS

INTRODUCTION EE GMBH – MEMBER OF TÜV NORD GROUP



DATEN UND FAKTEN

EE ENERGY ENGINEERS GmbH

- **FOUNDED:** 1996; since 2007, a 100% subsidiary of TÜV NORD GROUP
- **LOCATIONS:** Gelsenkirchen, Düsseldorf
- **TURNOVER 2016:** 5.6 million €
- **STAFF:** 75 FTE (2/3 engineers)
- **TOPICS:** Energy Efficiency (EE), Renewable Energies (RE),
- **SERVICES:** EE/RE Consulting, EE Auditing, EE Certification

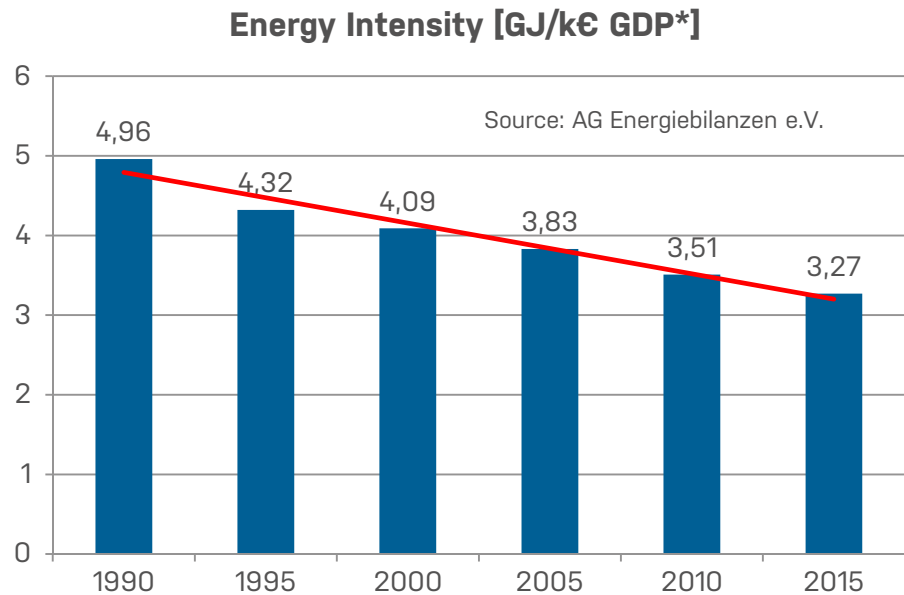
Düsseldorf



Gelsenkirchen



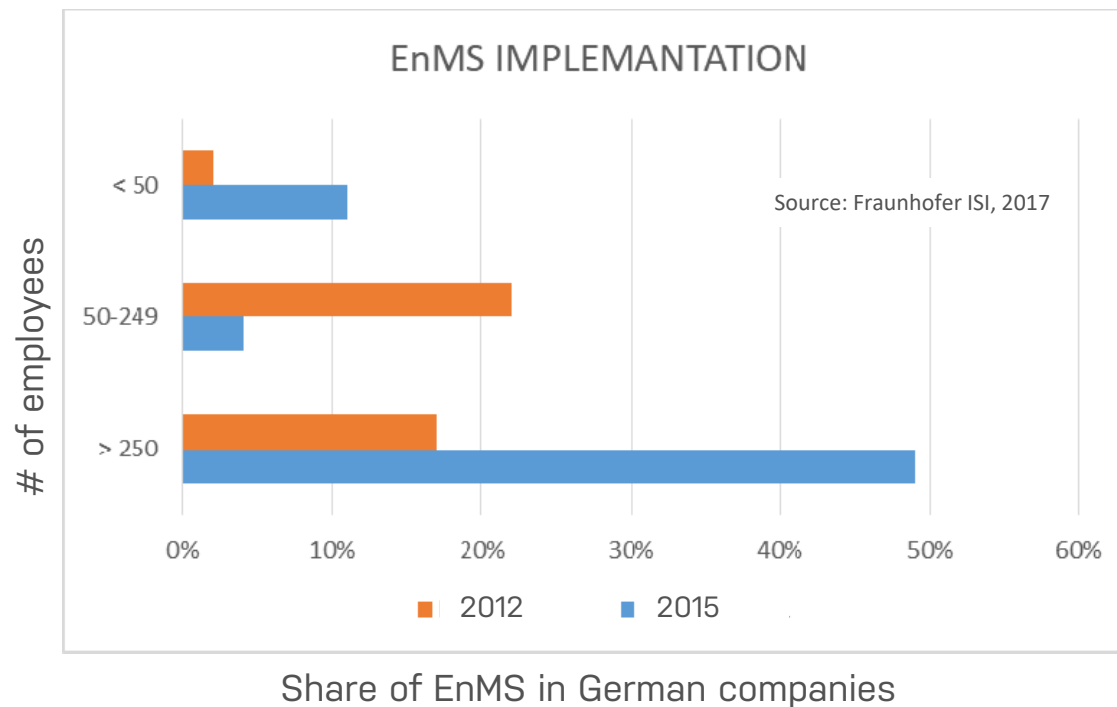
ENERGY EFFICIENCY – STILL AN ISSUE?



* adjusted for weather-related temperature and inventory effects

- Energy Intensity significantly reduced via technical and organizational improvements
- Cost issues and legal requirements have been main drives (e.g. EED)
- Today, approximately 20% of all company in Germany are running an EnMS

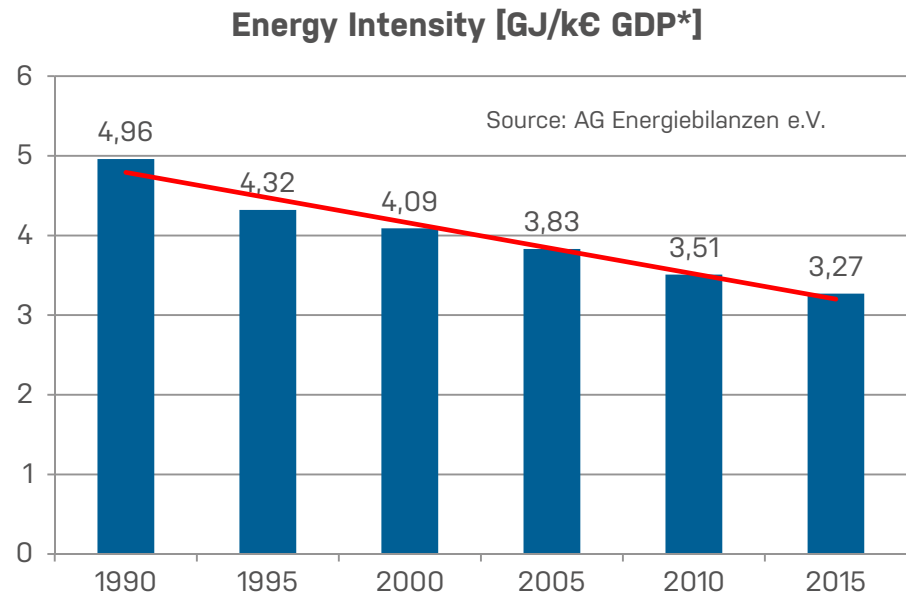
A SUCCESS STORY – ENMS (ISO EN 50001) IN GERMANY



Even if an ENMS does not save any single kWh it is a major backbone for the implementation of technical EE measures

(Non-SME performed energy audits according to ISO EN 16247-1).

ENERGY EFFICIENCY – STILL AN ISSUE?



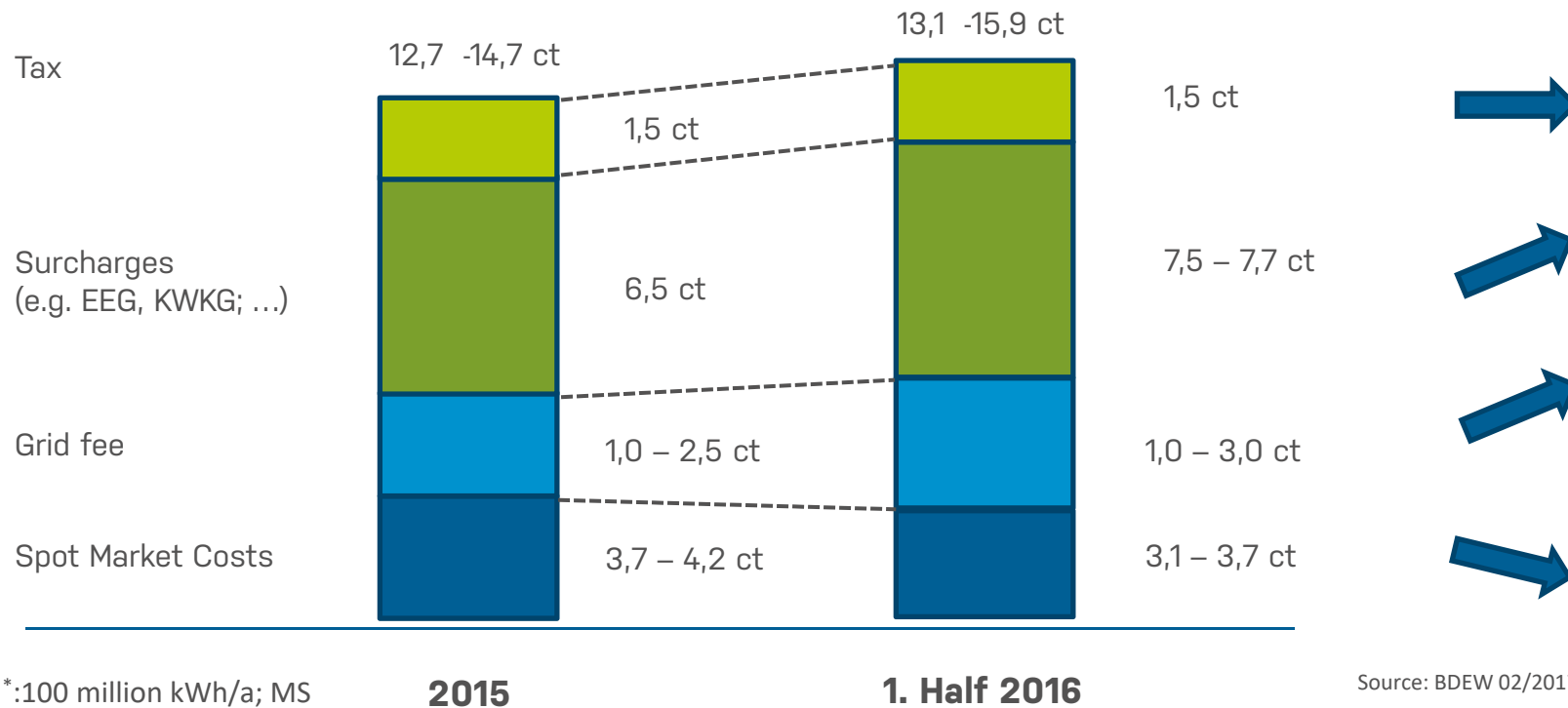
* adjusted for weather-related temperature and inventory effects

- EnMS often enabler for investments into EE measures and EE awareness
- However, still significant potential for further EE measures identified and proofed (up to another 15-20 % of current demand)
- As industry has picked more or less "low-hanging fruits" implementation of additional EE measures need to compete with investment alternatives
- "External" financing of EE projects crucial (revival of contracting?, leasing)

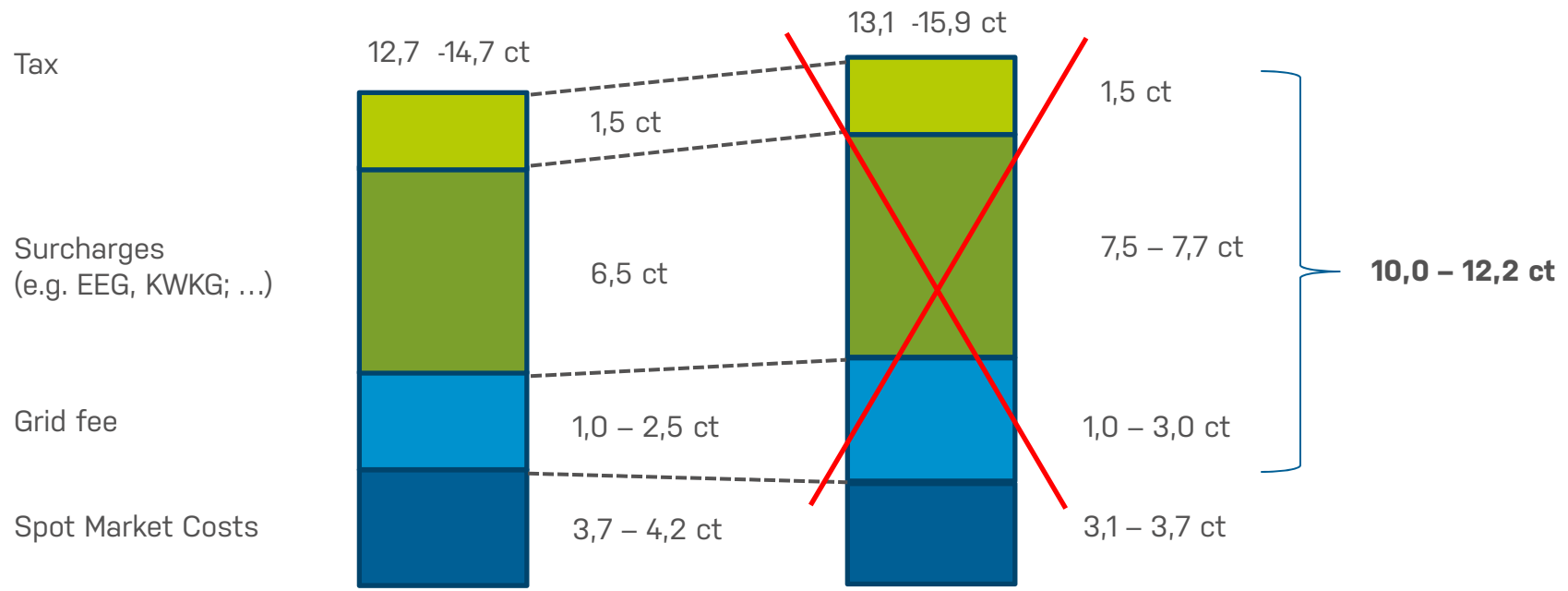


SHIFT TOWARDS SURCHARGE REDUCTION OF ENERGY COSTS!

COSTS OF INDUSTRIAL POWER SUPPLY IN GERMANY *



COSTS OF INDUSTRIAL POWER SUPPLY IN GERMANY *



*:100 million kWh/a; MS

2015

1. Half 2016

Source: BDEW 02/2017



ONSITE GENERATION AND „SELF-USEAGE“ (EVEN BY RE) IS CHEAPER THAN BUYING POWER AT THE STOCK MARKET!

ONSITE GENERATION – ENABLER FOR SECTOR COUPLING

„Surplus“ Power

P2H
(Power-to-Heat)



Source: Von Discostu (Michael Gruhl) - Eigenes Werk, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=11403649>

e.g. Stadtwerke Flensburg:
low temperature heat generation
via electro vessel for district heating

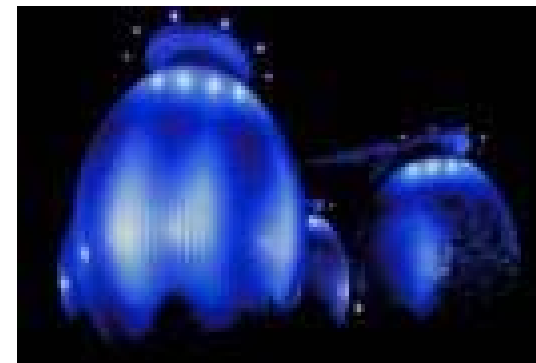
P2G
(Power-to-Gas)



Source: h2-netzwerk.ruhr

e.g. Stadtwerke Herten
Hydrogen production for FCEV
via electrolysis

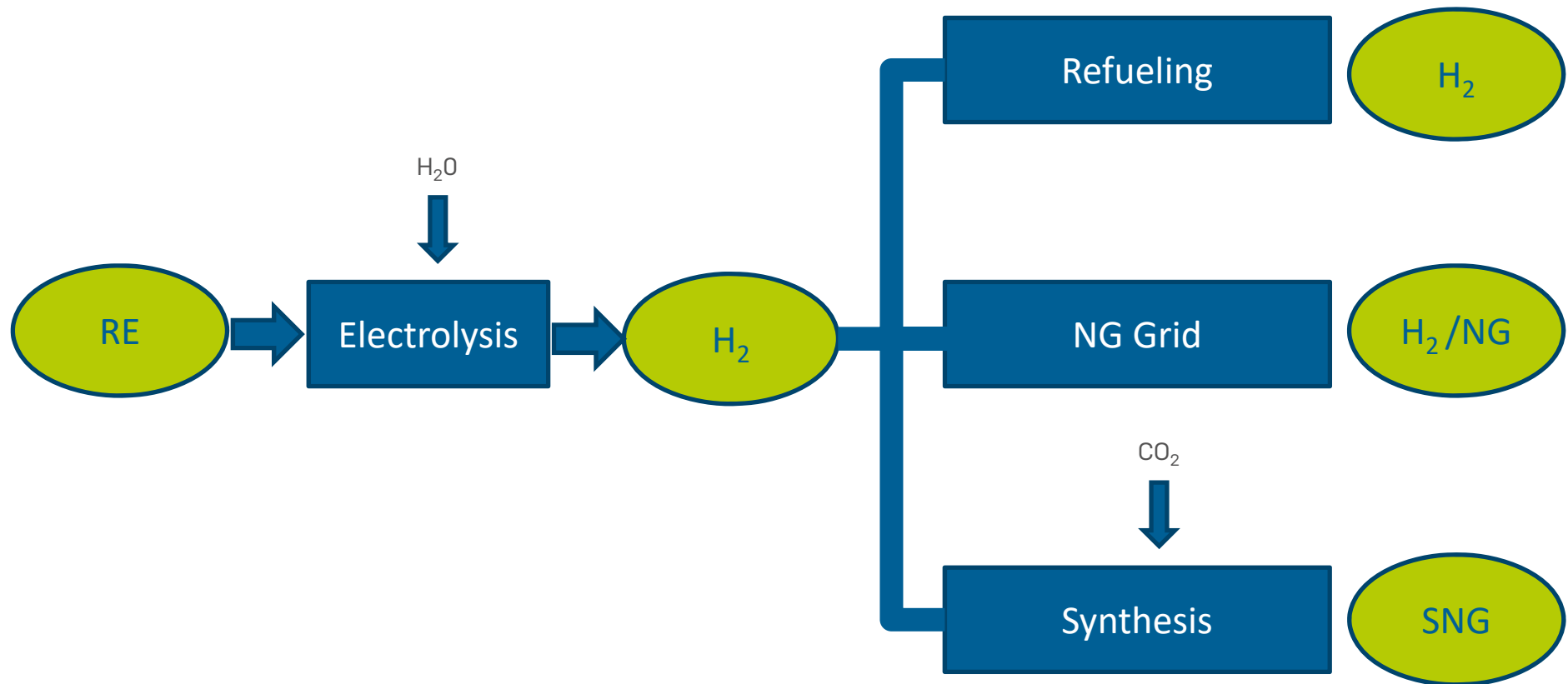
P2Chem



Source: Emschergenossenschaft e.V.

e.g. EG Bottrop
SNG from sewage gas and RE

THE PTX - STORY ...



SECTOR COUPLING – SOME PRACTICAL EXAMPLES



AirLiquide, Düsseldorf

RVK, Köln

EG, Bottrop

CONCLUSION

- EE measures (technical and organizational) have been very successful in German Industry so far; further steps need in particular new financial tools.
- A consistent regulatory framework as well as cost issues have driven the development.
- Scope of EE measures (cost saving potential) is getting much broader and aims for sector coupling techniques to address EE potentials inside and outside industry

... things are getting even more complicated!



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